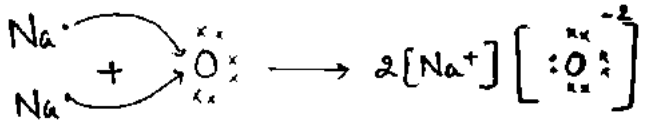
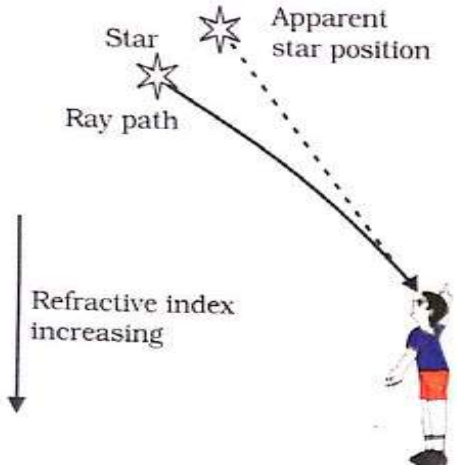
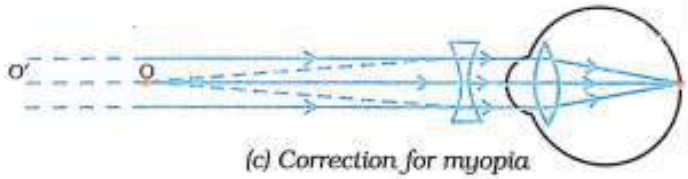
MARKING SCHEME – SCIENCE (Code No.31/3/3) SET-III

Q.N	Key Points	Marks	Grand Marks
1	1000 watt of power is used for 1 hour / commercial unit of energy / 3.6×10^6J	1	1
2	Lack of decomposers in aquarium	1	1
3	Causes i) gradual weakening of the ciliary muscles ii) diminishing flexibility of the eye lens. (No diagram given in t.b. or reference books. Diagram for lens used, use a bifocal lens)	1 1	2
4		2	2
5	Reflex Action - Reflex action is involuntary action - It is controlled by spinal cord Walking - Walking is voluntary action - It is controlled by brain / cerebellum OR Pepsin -Secreted by the stomach - It acts in acidic medium Trypsin - Secreted by the Pancreas - It acts in basic medium	½ + ½ ½ + ½ ½ + ½ ½ + ½	2 2
6	• Nuclear fission. • When the nucleus of heavy atom is bombarded with low energy neutrons, can be split apart into lighter nuclei. When this is done, a tremendous amount of energy is released. i) It releases 10 millions times / tremendous amount of energy produced by other fossil fuels. ii) It can be used to generate clean electricity iii) Self sustainable chain reaction (any two)	½ + ½ 1+1	3
7	Forests are rich reservoir of biodiversity containing a large number of plants and animals. Approaches towards conservation of forests: a) Help of local people should be taken / local people should be involved b) Indiscriminate destruction of forest should be strictly prohibited. c) Planting of trees should be increased. d) Destruction of forests should not be done for making, roads, dams and hotels etc.	1 ½ x 4	3
8	• Bending of light due to the variation in optical density of the medium. • The starlight, on entering into earth's atmosphere	½ ½	

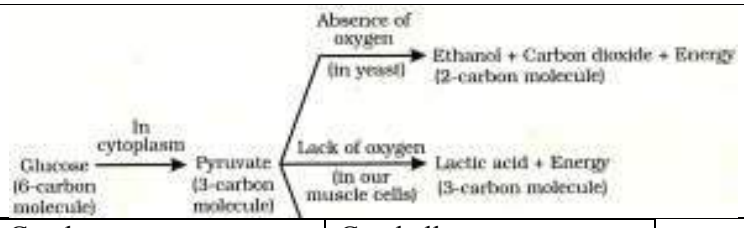
	undergoes continuous refraction before it reaches the earth. • The since the atmosphere bends starlight towards the normal, the apparent position to the star is slightly different from its actual position.  Diagram with Correct labeling OR (i) If the student cannot see the words written on the black board then he is considered myopic. (ii) The defect may arise due to 1) Excessive curvature of the eyeball 2) Elongation of the eyeball (iii)  (c) Correction for myopia	½ 1½ 1 ½ x 2 1	3
9	• $Na_2CO_3.10H_2O$ • $2NaHCO_3 \xrightarrow{Heat} Na_2Co_3 + H_20 + CO_2$ / by heating (Baking Soda) (Sodium Carbonate) $(Na_2CO_3 + 10H_20 \longrightarrow Na_2CO_3.10H_20)$ (Sodium Carbonate) (Washing Soda) Uses • In Glass, Soap and Paper Industry (any two)	1 1 ½ + ½	3
10		1	

Activity	Observation	Inference
Put metal R in the sulphate solution of metal Q and P Put metal P in the solution of sulphate ions of metal Q	Solution becomes colourless in both the test tubes. No reaction	R displaces P and Q ions from their solutions. P cannot displace Q ions from the solution

1

1

	So the P < Q < R (From activity to inference award 1 mark) OR Cinnabar / (HgS) $2HgS + 3O_2 \rightarrow 2HgO + 2SO_2$ $2HgO \xrightarrow{\Delta} 2Hg(l) + O_2$ (Complete process explained in the form of sentence full credit may be given.)	1 1 1 1	3
11	An element's valency is determined by the number of electrons in its outer most shell. Electronic configuration: Atomic No. = 15 Electronic configuration of element X = 2,8, 5 Valency of Element X = 8 – 5 = 3 Hence the valency of element X is 3.	1 1 1	3
12.	• Respirator Pigment responsible for O_2 transport. Consequences: - Can affect the O_2 supplying capacity of blood to the tissues - Causes anaemia .	1 1 + 1	3
13	a) Speciation: It refers to the process by which new species are formed from the pre-existing species i) Geographical isolation ii) Genetic drift iii) Natural selection (b) Natural selection is the process by which organisms having some special features are at an advantage for better survival in the changed environment. (Or explanation with the help of the any example) **OR** • F_1 generation – all plants with round seeds • F2 generation – plants with round and wrinkled seeds. • Tall / dwarf plants Yellow / green seeds White / purple flowers (any two)	1 ½ 1½ 1 ½ + ½ ½ + ½	3
14	The first step in the breakdown of glucose. Glucose is converted to pyruvate. - Pyruvate in the absence of O_2 may be converted to ethanol, CO_2 and energy - Pyruvate in the shortage of O_2 may be converted to lactic acid and energy. OR	1 1 1	



3

15

Cerebrum	Cerebellum
1) It is a part of fore brain	1) It is a part of hind brain
2) It initiates intelligence, memory, voluntary movements etc.,	2) It maintains posture and equilibrium
3) Main thinking part of the brain.	3) Controls voluntary actions like walking in a straight line, picking up a pencil, riding a bicycle etc.

½ + ½

½ + ½

½ + ½

3

16

(a)

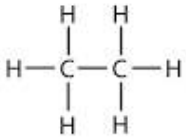
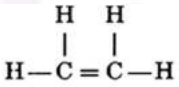
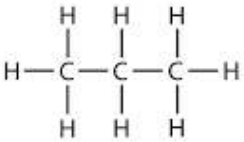
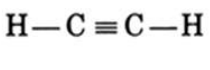
- Carbon compounds containing only carbon and hydrogen ore called hydrocarbons

Example: Alkane / Alkene / Alkyne / any other **(any one)**

½

½

(b)

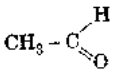
Saturated Hydrocarbons	Unsaturated Hydrocarbons
Consists of Only Single Bonds	Consists of Double and Triple bonds
 Ethane	 Ethene
 Propane	 Ethyne

2

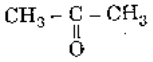
(c)

(i) CH3 – OH

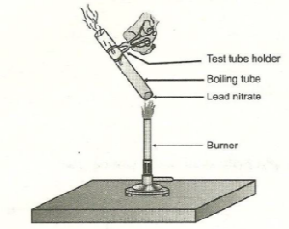
Methanol / Methyl alcohol

(ii) 

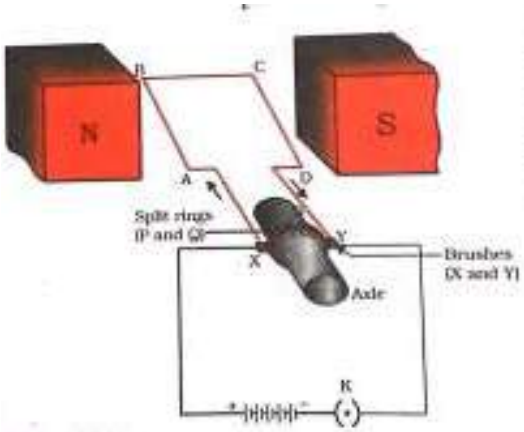
Ethanal / Acetaldehyde

(iii) 

Propanone / acetone

	(iv) $CH_3-\overset{\overset{O}{\|}}{C}-OH$ Ethanoic Acid / Acetic acid	½ x 4	5
17	(a) Exchange of ions in a reaction between two. (b) $Na_2SO_4 + BaCl_2 \longrightarrow BaSO_4 + 2\ NaCl$ (If the answer is descriptive form award marks) (b) (i) Combination reaction: A combination reaction is a reaction where two or more elements or compounds combine to form a single compound. (ii) $CaO + H_2O \rightarrow Ca(OH)_2$ Quick lime Calcium Hydroxide\ Chemical name of the product formed - (calcium hydroxide (slaked lime) (iii) Observations of the reactions: - Reaction takes place vigorously - Large amount of heat is released. OR (a) Activity : Take a pinch of lead nitrate powder in a test tube. Heat it over the flame.  (½ marks for labeling) (b) Observation : • Emission of brown fumes observed • Reddish brown colour of residue (any one) (c) $2Pb(NO_3)_2(s) \xrightarrow{Heat} \underset{\text{Lead oxide}}{2PbO(s)} + \underset{\text{Nitrogen dioxide}}{4NO_2(g)} + \underset{\text{Oxygen}}{O_2(g)}$ (Lead nitrate)	1 1 ½ + ½ ½ ½ ½ + ½ 1 1 ½ + ½ 1+1	5 5
18	(a) • Virtual • Erect • Diminished • On the same side of the object (b) Focal Length = 20cm. u = – x cm	½ x 4 1	

	v = $\frac{x}{3}$ $\frac{1}{v}-\frac{1}{u}=\frac{1}{f}$ x = 80 cm	1 1	 5
19	(a) • In series - $R_S=R_1+R_2+R_3$. • In parallel - $\frac{1}{R_p}=\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}$ Resistance is at minimum - $\frac{1}{R_p}=\frac{1}{R_1}+\frac{1}{R_2}$ $\frac{1}{12}+\frac{1}{12}=\frac{2}{12}=6\Omega$ Resistance is maximum - $R_S=R_1+R_2$ $R_s = 12+12=24\ \Omega$ P = $\frac{v^2}{R}$ Power ration in parallel and series = 4:1 (b) $\frac{P_{min}}{P_{max}}=\frac{V^2/R_{min}}{V^2/R_{max}}=\frac{R_{max}}{R_{min}}=\frac{24}{6}=\frac{4}{1}$ OR (a) $R\alpha l$ $R\alpha\frac{1}{A}$ $R\alpha\frac{l}{A}$ $R=\rho\frac{l}{A}$ $\rho=\frac{RA}{l}=\frac{ohm\times m^2}{m}$ $=ohm\times m$ (b) $\rho=\frac{RA}{l}$	½ ½ 1 1 2 ½ x 6 ½ ½	

	$= \frac{100 \times 3 \times 10^{-7}}{5}$ $= 60 \times 10^{-7}\ ohm \times m$	1	5
20	(a) • The rule is Fleming's left hand rule. • If the finger points in the direction of the magnetic field and the second finger in the direction of the magnetic field and the second finger in the direction of current then the thumb will point in the direction of motion or the force acting on the conductor (b) Electric motor.  	1 2 2	5
21	a) **Reproduction-** The process of producing ofsprings / young ones of its own kind. Types: i) Asexual ii) Sexual **b)** **Unicellular Organisms** / **Multicellular Organisms** 1) Only one parent is required / Two parents are required 2) It is a fast process of reproduction. / Slower process of reproduc than in unicellular organisn 3) No specialized cells are required for reproduction. / Specialized cells are requir reproduction. **(Any two points)** **OR** a) STD- A disease that can be transmitted through sexual contact.	1 1 1 1 1	

	• Viral – i)Warts ii) AIDS • Bacterial- i) Gonorrhoea ii) Syphilis b) Contraception: The method of preventing unwanted pregnencies, Reasons – i) To prevent unwanted pregnancies ii)To control population rise / birth rate iii)To prevent transfer of STD's iv)Proper gap between successive births v)For the better health of mother (Any three)	1 ½ + ½ ½ + ½ ½ ½ x3	5
22	a) Saffranin is used to stain the material for better view. b) Glycerine is used to avoid drying of peel. OR i) Take a thin peel of leaf on a glass slide. ii) Stain it with saffranin iii) Remove extra stain iv) Put a drop of glycerin and cover it with cover slip	1 1 ½ ½ ½ ½	2
23	i) Conical flask is not air tight. ii) Freshly prepared solution of KOH not used. iii) Germinating seeds may be dry. (any two)	1+1	2
24	a) 0.15V is the least count b) The reading shown is 1.8V $c)\ R = 20\Omega$ V=1.8V I=$\frac{V}{R} = \frac{1.8}{20} = .09amp$	½ ½ 1	2
25	i. Fix a concave mirror on a stand and place it near a source of bright light ii. Place a screen fitted on a stand in front of the mirror iii. Move the screen back and forth, until a sharp and clear image of a distance object line a tree is obtained on the screen iv. Mark the position of mirror and screen on the scale and note the distance between them OR The student should take the following precaution (a) Precaution - (i)See that the pins are in a straight line and atleast 3cm apart. (ii)Angle of incidence should be between 30^0 to 60^0. (iii) Glass slab should always remain inside the boundary. (any two) (b) Conclusion - (i) The emergent ray is parallel to incident ray (ii) Lateral displacement takes place. (iii) Angle of incidence = Angle of emergence (any two)	½x4 ½ ½ ½ ½	2
26	Ethanoic acid		

	a) Odour – it smells like vinegar b) It is soluble in water c) Blue litmus to red d) $NaHCO_3 + CH_3COOH \rightarrow CH_3COONa + H_2O + CO_2$	½ ½ ½ ½	2
27	• Putting Cu strips in $FeSO_4$ --- no reaction • Putting Al strips in $FeSO_4$ -- change in colour observed • Displacement reaction • $Al+FeSO_4 \rightarrow Al_2(SO_4)_3+Fe$ (OR) 1) Do not point the mouth of boiling tube at your neighbours or yourself / point the test tube away from the body 2) Hold the test tube in inclined position 3) Hold the test tube with Tongs (Any two)	½ ½ ½ ½ 1+1	2